

**What is claimed is:**

1. A synchronization establishing and tracking circuit for a CDMA base station comprising:

a first spreading code generator generating a first spreading code sequence;

5 a first correlator calculating first correlation between said first spreading code sequence and a first quasi-coherent signal corresponding to a first received signal received by said CDMA base station;

10 a second spreading code generator generating a second spreading code sequence;

a second correlator calculating second correlation between said second spreading code sequence and a second quasi-coherent signal

15 corresponding to a second received signal received by said CDMA base station; and

a phase determining circuit determining a first phase of said first spreading code sequence based on an added quasi-coherent signal to which  
20 said first and second quasi-coherent signals are added.

2. A synchronization establishing and tracking circuit according to claim 1, wherein said phase determining circuit includes:

a ranking portion determining a plurality

5 of target phases based on said added quasi-coherent signal; and

a phase setting circuit setting said first phase to a selected phase selected from among said target phases.

3. A synchronization establishing and tracking circuit according to claim 2, wherein said ranking portion determines an order of priority for said target phases based on said added quasi-coherent signal, and

wherein said phase setting circuit selects said selected phase in accordance with said order of priority.

4. A synchronization establishing and tracking circuit according to claim 2, wherein said ranking portion comprises:

a phase determining spreading code generator generating a phase determining spreading code sequence, wherein a phase of said phase determining spreading code sequence is sequentially shifted to one of candidate phases;

a phase determining correlator calculating correlation between said phase determining spreading code sequence and said added quasi-coherent signal to determine added signal

correlation values respectively corresponding to said candidate phases;

15           a ranking circuit selecting said target phases based on said correlation values.

5.       A synchronization establishing and tracking circuit according to claim 1, further comprising:

          a maximum correlation phase determining circuit determining a despreading phase based on

5   said first correlation;

          a despreading circuit despreading said first quasi-coherent signal to produce a despread signal using another spreading code sequence having said despreading phase; and

10          a synchronization detecting circuit detecting a synchronization of said first quasi-coherent signal with said another spreading code sequence to output a synchronization informing signal informing said first spreading code  
15 generator of said synchronization, wherein said first spreading code generator fixes said first phase based on said synchronization informing signal such that said synchronization of said  
20 first quasi-coherent signal with said despreading spreading code sequence is established.

6.       A synchronization establishing and tracking

circuit according to claim 1, wherein said phase  
determining circuit determining a second phase of  
said second spreading code sequence based on said  
5 added quasi-coherent signal.

7. A synchronization establishing and tracking  
circuit according to claim 6, wherein said a  
phase determining circuit includes:

a ranking portion which determines a  
5 plurality of target phases based on said added  
quasi-coherent signal; and

a phase setting circuit setting said first  
and second phases to a selected phase selected  
from among said target phases.

8. A synchronization establishing and tracking  
circuit according to claim 7, wherein said  
ranking portion determines an order of priority  
for said plurality of target phases based on said  
5 added quasi-coherent signal, and

wherein said phase setting circuit selects  
said selected phase in accordance with said order  
of priority.

9. A synchronization establishing and tracking  
circuit according to claim 7, wherein said  
ranking portion comprises:

a phase determining spreading code  
5 generator generating a phase determining  
spreading code sequence, wherein a phase of said  
phase determining spreading code sequence is  
sequentially shifted to one of candidate phases;

a phase determining correlator calculating  
10 correlation between said phase determining  
spreading code sequence and said added quasi-  
coherent signal to determine added signal  
correlation values respectively corresponding to  
different phases of said candidate phases;

15 a ranking circuit selecting said target  
phases based on said correlation values.

10. A synchronization establishing and tracking  
circuit according to claim 1, further comprising:

a first maximum correlation phase  
determining circuit determining a first  
5 despreading phase based on said first  
correlation;

a first despreading circuit despreading  
said first quasi-coherent signal to produce a  
first despread signal using a third spreading  
10 code sequence having said first despreading  
phase;

a second maximum correlation phase  
determining circuit determining a second

despreading phase based on said second  
15 correlation;

a second despreading circuit despreading  
said second quasi-coherent signal to produce a  
second despread signal using a fourth despreading  
spreading code sequence having said second  
20 despreading phase; and

a space diversity circuit identifying a  
direction of a mobile station transmitting at  
least one of said first and second received  
signals, based on said first and second despread  
25 signals.

11. A synchronization establishing and tracking  
circuit for a CDMA base station comprising:

a spreading code generator generating a  
spreading code sequence;

5 a correlator calculating correlation  
between said spreading code sequence and a quasi-  
coherent signal corresponding to a received  
signal received by said CDMA base station;

a ranking circuit storing a plurality of  
10 ranked phases; and

a phase setting circuit setting said phase  
to a selected phase selected from among said  
plurality of ranked phases.

12. A synchronization establishing and tracking circuit according to claim 11, further comprising:

an adding circuit adding said quasi-  
5 coherent signal and at least one other quasi-coherent signal to produce an added quasi-coherent signal, wherein said other quasi-coherent signal corresponds to one or more other received signal received by said CDMA base  
10 station, and  
wherein said plurality of ranked phases are determined based on said added quasi-coherent signal.

13. A synchronization establishing and tracking method for a CDMA base station comprising:

generating a first spreading code sequence;  
calculating first correlation between said  
5 first spreading code sequence and a first quasi-coherent signal corresponding to a first received signal received by said CDMA base station;  
generating a second spreading code  
sequence;  
10 calculating second correlation between said second spreading code sequence and a second quasi-coherent signal corresponding to a second received signal received by said CDMA base

station;

15           producing an added quasi-coherent signal on  
which said first and second quasi-coherent  
signals are added; and  
             determining a first phase of said first  
spreading code sequence based on said added  
20 quasi-coherent signal.

14.    A synchronization establishing and tracking  
method according to claim 13, further comprising:

             determining a plurality of target phases  
based on said added quasi-coherent signal;

5           selecting a selected phase from among said  
plurality of target phases;

             setting said first phase to said selected  
phase.

15.    A synchronization establishing and tracking  
method according to claim 14, wherein said  
selecting includes:

             determining an order of priority for said  
5 target phases based on said added quasi-coherent  
signal; and

             selecting said selected phase based on said  
order of priority.

16.    A synchronization establishing and tracking



method according to claim 14, wherein said determining said plurality of target phases includes:

- 5           generating a phase determining spreading code sequence such that a phase of said phase determining spreading code sequence is sequentially shifted to one of candidate phases;  
            calculating correlation between said phase
  - 10           determining spreading code sequence and said added quasi-coherent signal to determine added signal correlation values respectively corresponding to said candidate phases; and  
            selecting said target phases from among
  - 15           said candidate phases based on said correlation values.
17.       A synchronization establishing and tracking method according to claim 13, further comprising:
- determining a despreading phase based on said first correlation;
  - 5           despreading said first quasi-coherent signal to produce a despread signal using another spreading code sequence having said despreading phase;
  - detecting a synchronization of said first
  - 10           quasi-coherent signal with said another spreading code sequence to output a synchronization

informing signal indicative of said  
synchronization; and

fixing said first phase based on said  
15 synchronization informing signal such that said  
synchronization of said first quasi-coherent  
signal with said another spreading code sequence  
is established.

18. A synchronization establishing and tracking  
method according to claim 13, further comprising:  
determining a second phase of said second  
spreading code sequence based on said added semi-  
5 synchronous.

19. A synchronization establishing and tracking  
method according to claim 18, further comprising:  
determining a plurality of target phases  
based on said added quasi-coherent signal; and  
5 setting said first and second phases to a  
selected phase selected from among said ranked  
phases.

20. A synchronization establishing and tracking  
method according to claim 13, further comprising:  
determining a first despreading phase based  
on said first correlation;  
5 despreading said first quasi-coherent

signal to produce a first despread signal using a third spreading code sequence having said first desreading phase;

determining a second desreading phase  
10 based on said second correlation;

desreading said second quasi-coherent signal to produce a second despread signal using a fourth spreading code sequence having said second desreading phase; and

15 identifying a direction of a mobile station transmitting at least one of said first and second received signals, based on said first and second despread signals.

21. A synchronization establishing and tracking method for a CDMA base station comprising:

generating a spreading code sequence;  
calculating correlation between said  
5 spreading code sequence and a quasi-coherent signal corresponding to a first received signal received by said CDMA base station;

storing a plurality of ranked phases; and  
setting said phase to a selected phase  
10 selected from among said plurality of ranked phases.

22. A synchronization establishing and tracking

method according to claim 20, further comprising:

adding said quasi-coherent signal and at  
least one other quasi-coherent signal to produce  
5 an added quasi-coherent signal, wherein said  
other quasi-coherent signal corresponds to one or  
more other received signal received by the CDMA  
station, and

wherein said plurality of ranked phases are  
10 determined based on said added quasi-coherent  
signal.